

NOTES ON BROMELIACEAE. V

Lyman B. Smith

MEXICO

TILLANDSIA INTUMESCENS L. B. Smith, sp. nov.

T. inflatam Mez in memoriam revocans sed bracteis florigeris semper densissime imbricatis, carinatis, haud glaucis, sepalis posterioribus alato-carinatis differt.

Plant over 6 dm. high; leaves numerous in an infundibuliform rosette, 85 cm. long, covered with pale appressed scales, sheaths elliptic, ample, 15 cm. long, often purple, blades very narrowly triangular, about 5 cm. wide at base; scape curved, stout; scape-bracts densely imbricate, subfoliaceous with roseate bases, their blades exceeding the inflorescence; inflorescence subdensely bipinnate; primary bracts with broadly ovate sheaths several times shorter than the spikes but blades exceeding the lower ones; spikes pinnately arranged, spreading, sessile, lance-oblong, acute, thick but distinctly complanate, 10-12 cm. long, 30-35 mm. wide; floral bracts very densely imbricate, very broadly ovate, 4 cm. long, 3 cm. wide, exceeding the sepals, acute, apiculate, broadly convex, carinate, thin-coriaceous and verrucose when dry, roseate; flowers subsessile; sepals lanceolate, acute, 25 mm. long, the posterior ones short-cornate and alate-carinate; petals 45 mm. long, violet, stamens exerted. Pl. I, fig. 1: Spike x 1/2; fig. 2: Ventral side of floral bract x 1; fig. 3: Posterior sepal x 1.

Type in the U. S. National Herbarium, no. 2144662, collected on dry slopes in high woods, between Ixtapantongo and La Junta, altitude 600-800 meters, April 24-25, 1954, by E. Matuda (no. 30665).

MEXICO: MEXICO: Moist slopes, mouth of arroyo, Ixtapan de la Sal, alt. 1800 m., April 2, 1952, Matuda 26160 (US). Moist slopes, mixed oak and pine woods, Cañada de Nanchititla, alt. 1600 m., May 25-26, 1954, Matuda 30793 (US); 30794 (US).

Owing to the rather firm texture of its floral bracts, this species would fall next to T. calothyrsus Mez in the key in the North American Flora (19: 108. 1938). However, the tripinnate inflorescence and narrow spikes of T. calothyrsus make it resemble T. intumescens much less than T. inflata Mez does.

VENEZUELA

PITCAIRNIA TYMPANI L. B. Smith, sp. nov.

P. microcalycem Baker simulans sed sepalis oblongis obtusis, petalis nudis differt.

Incompletely known, solitary and 2 m. high (! Hanbury-Tracy); leaves homomorphic and entire so far as known, over 11 dm. long, glabrous above, obscurely appressed-lepidote beneath, narrowed above the large elliptic sheath but not truly petiolate, bearing

a narrow pale median channel, blade linear-lanceolate, acuminate, 35 mm. wide; upper part of scape 8 mm. thick, glabrous, red; its bracts shorter than the internodes, very narrowly triangular; inflorescence simple, densely many-flowered, 23 cm. long, white-flocculose (? or infected with a fungus); floral bracts very narrowly triangular, much exceeding the pedicels, thin; pedicels slender, 5 mm. long; flowers spreading; sepals oblong, obtuse, 18 mm. long, ecarinate; petals linear, 5 cm. long, naked, yellow (! Hanbury-Tracy); stamens included; ovary $2/3$ superior; ovules caudate. Pl. I, fig. 4: Leaf x 1/10; fig. 5: Flower x 1; fig. 6: Sepals x 1.

Type in the herbarium of the Royal Botanic Gardens, Kew, collected in moist dells and thickets between the bare edges of the páramo, on western and northwestern slopes only, Páramo del Tambor, State of Mérida, Venezuela, altitude 2,820 meters, August 23, 1938, by J. Hanbury-Tracy (No. 60). Duplicate in the U. S. National Herbarium.

COLOMBIA

GUZMANIA ANGUSTIFOLIA (Baker) Wittm. var. NIVEA L. B. Smith, var. nov.

A var. angustifolia bracteis florigeris niveis differt. Floral bracts pure white.

Type in the Gray Herbarium, collected at Las Mesas near Pepino, Territory of Putumayo, Colombia, altitude 1,350 meters, November 22, 1946, by M. B. & R. Foster (No. 2226).

PITCAIRNIA BULBOSA L. B. Smith, sp. nov.

A P. patentiflora L. B. Smith, cui affinis, omnibus partibus robustioribus, pedicellis brevibus, costatis, quam bracteis florigeris haud vel vix longioribus differt.

Stemless, over 1 m. high; leaves numerous, 5 dm. long, sheaths suborbicular, 3 cm. in diameter, dark castaneous, forming a compact pseudobulb 8 cm. in diameter, blades very narrowly triangular, acuminate, pungent, not at all narrowed at the base, 25 mm. wide, covered with a membrane of coalesced cinereous scales, becoming glabrous above, very laxly serrate with uncinata antrorse spines 2 mm. long; scape unknown; inflorescence laxly bipinnate, red, sparsely pale-lepidote becoming glabrous; primary bracts narrowly triangular, acuminate, 10 cm. long, exceeding the short peduncle; branches spreading-ascending, laxly many-flowered, 35 cm. long; floral bracts broadly elliptic, acute, 10 mm. long, equaling or slightly shorter than the stout costate pedicels; flowers spreading; sepals linear, lanceolate, acute, 35 mm. long, ecarinate, sulcate with age; petals about 45 mm. long, greenish white, naked; ovary slightly more than half inferior; seeds alate. Plate I, fig. 7: Base of leaf, dorsal side x 1/2; fig. 8: Flower x 1; fig. 9: Sepal x 1; fig. 10: Seed x 5.

Type in the U. S. National Herbarium, Nos. 1987787 and 1987788, collected in dry rich soil in crevices of an enormous granite rock, by the Río Atabapo, Comisaría of Vaupés, Colombia,

altitude 250 meters, November 27, 1948, by Jorge Araque Molina and Fred A. Barkley (No. 18-Va-228).

PITCAIRNIA JOHANNIS L. B. Smith, sp. nov.

Habitus petalaeque *P. stenophyllae* André in animo revocans sed foliis homomorphis integrisque, bracteis florigeris brevibus differt.

Aggregated, the flowering shoot 86 cm. high; leaves numerous, fasciculate, homomorphic, to 45 cm. long, glabrous at maturity, sheaths suborbicular, 1 cm. in diameter, dark castaneous, blades linear, filiform-acuminate, slightly narrowed toward base, 10 mm. wide, entire, bearing a conspicuous pale median channel; scape straight, very slender, sparsely white-flocculose becoming glabrous; scape-bracts strict, very narrowly triangular, the uppermost much shorter than the internodes; inflorescence simple, lax, 25 cm. long, sparsely white-flocculose; floral bracts elliptic, acute, shorter than the pedicels; flowers subspreading; pedicels slender, to 15 mm. long; sepals asymmetric, linear-lanceolate, acute, 30 mm. long, obtusely carinate; petals narrowly oblanceolate, acuminate, 4 cm. long, white, appendaged; stamens included; ovary $2/3$ superior; ovules caudate. Pl. I, fig. 11: Base of leaf x $1/2$; fig. 12: Flower x 1; fig. 13: Sepal x 1.

Type in the U. S. National Herbarium, No. 1,995,440, collected in crevices of sandstone, Quebrada Boquerona, at confluence with Quebrada La Putana, west of Cordillera de La Paz, Department of Santander, Colombia, altitude 200 meters, latitude $7^{\circ} 5'$ north, longitude $73^{\circ} 30'$ west, July 7, 1944, by H. St. John (No. 20554).

PITCAIRNIA TRIMORPHA L. B. Smith, sp. nov.

A *P. stenophylla* André, cui affinis laminis foliorum latioribus, bracteis florigeris quam pedicellis plerumque brevioribus, apiculatis, sepalis majoribus differt.

Stemless, about 1 m. high; leaves numerous, fascicled, sheaths broadly ovate, 3 cm. long, dark castaneous, entire, blades glabrous, trimorphic, the outermost small, linear, spinose-serrate, persistent, the next elliptic, entire, brown when dry, 5-8 cm. long, the innermost green, deciduous along a straight transverse line, linear, acuminate, narrowed slightly toward base, 6-8 dm. long, 20 mm. wide, entire; scape erect, slender; scape-bracts very narrowly triangular, filiform-acuminate, the highest shorter than the internodes; inflorescence simple or few-branched; primary bracts shorter than the sterile bases of the branches; racemes lax, 12-25 cm. long, sparsely white-flocculose, becoming glabrous; floral bracts elliptic, apiculate, all but the lowest distinctly shorter than the pedicels; flowers divergent; pedicels slender, 11 mm. long; sepals linear-lanceolate, acute, 33 mm. long, ecarinate; petals white, 5 cm. long, bearing a truncate scale at base; ovary $4/5$ superior; ovules caudate. Pl. II, fig. 1: Leaf-blade x $1/10$; fig. 2: Flower x 1; fig. 3: Sepal x 1.

Type in the U. S. National Herbarium, Nos. 1,987,774 and 1,987,775, collected in rocky granitic soil, subarid wooded valley, Pailas, 5 kilometers south of Pie de Cuesta, Department of Santander, Colombia, altitude 950 meters, December 16, 1948, by Jorge Araque Molina and Fred A. Barkley (No. 18-S-238).

PUYA BARKLEYANA L. B. Smith, sp. nov.

P. killipii Cuatrecasas proxima sed laminis foliorum utrinque dense lepidotis, bracteis florigeris vix lucidis, sepalis diutine albedo-lanatis.

Stemless, 1 m. high; leaves numerous, to 44 cm. long, sheaths broadly ovate, 5 cm. long, nearly white except for the dark castaneous apex, glabrous, blades linear, acuminate, pungent, 2 cm. wide, covered on both sides with fine appressed cinereous scales, laxly serrate with minute ascending spines; scape stout, erect; scape-bracts strict, imbricate, ovate, glabrous, brown and slightly lustrous, the lower ones with small foliaceous blades; inflorescence subdensely racemose, 45 cm. long; axis stout; floral bracts straight, orbicular with a narrowly triangular minutely serrate apex, 5 cm. long, about equaling the sepals, thin, brown, glabrous, slightly lustrous; pedicels slender, 25 mm. long, white-lanate; sepals oblong, broadly acute, 28 mm. long, 7 mm. wide, nerved, persistently white-lanate; capsule subglobose, 2 cm. long. Pl. II, fig. 4: Section of leaf x 1; fig. 5: Flower x 1; fig. 6: Floral bract x 1/2; fig. 7: Sepal x 1.

Type in the U. S. National Herbarium, Nos. 1,987,781 and 1,987,782, collected on very dry clay soil with few rocks, open fields on mountain crest, 2 kilometers from Berlín, Department of Santander, Colombia, altitude 2800 meters, December 18, 1948, by Jorge Araque Molina and Fred A. Barkley (No. 18-S-404).

PUYA GARGANTAE L. B. Smith, sp. nov.

P. santanderensis Cuatrecasas, cui affinis, inflorescentia anguste cylindrica, sepalis acuminatis differt.

Stemless, 8 dm. high; leaves numerous, 20 cm. long, sheaths suborbicular, 3 cm. in diameter, entire, white, glabrous, blades linear, acuminate, 15 mm. wide, glabrous above, covered beneath with appressed cinereous scales, bearing coarse spreading scales on the margin, very laxly serrate with dark spreading straight or uncinatate spines 2.5 mm. long; scape erect, stout; scape-bracts strict, densely imbricate, elliptic, brown and subchartaceous when dry, pale-lanate becoming glabrous, all but the highest with foliaceous blades; inflorescence simple, slenderly cylindrical, 25 cm. long, about 4 cm. in diameter in fruit, pale-lanate; floral bracts straight, densely imbricate, ovate, acuminate, 6 cm. long, much exceeding the sepals, entire, membranaceous, brown with finely crisped margins when dry; pedicels subcylindric, slender, 8 mm. long; sepals elliptic, acuminate, 27 mm. long, membranaceous; petals twisted together after anthesis; capsule subglose, 15 mm. long. Pl. II, fig. 8: Base of leaf x 1/2; fig. 9: Ventral side of flower and

floral bract x 1; fig. 10: Sepal x 1.

Type in the U. S. National Herbarium, Nos. 1,989,504 and 1,989,505, collected on páramo, between La Laguna and Nariz de Judío, Mutiscua, Department of Norte de Santander, Colombia, June 19, 1946, by Miguel de Garganta (No. 1197). Isotype in the Chicago Natural History Museum.

PUYA GRANTII L. B. Smith, sp. nov.

P. lineata Mez in systema Mezii proxima sed scapi bracteis supremis laxioribus, bracteis florigeris integris, sepalis duplo majoribus differt.

Stemless, 5 dm. high; leaves numerous, 3 dm. long, sheaths suborbicular, 3 cm. in diameter, white and glabrous except the extreme apex, blades linear, acuminate, pungent, 2 cm. wide, glabrous above, covered beneath with subappressed cinereous scales, laxly serrate with pale slender ascending spines 3 mm. long; scape erect, 1 cm. in diameter, finely white-flocculose, becoming glabrous; lowest scape-bracts foliaceous and densely imbricate, the highest barely equaling the internodes and exposing most of the scape, ovate, acute, subchartaceous, dark red; inflorescence simple, 12 cm. long, lax at base, finely white-flocculose; floral bracts like the upper scape-bracts, 35 mm. long, entire, slightly exceeded by the sepals; flowers divergent to spreading; pedicels cylindric, 10 mm. long; sepals lance-oblong, broadly acute, 34 mm. long, ecarinate, thick, coriaceous; petals twisted together after anthesis; capsule stout-ellipsoid, 2 cm. long. Pl. II, fig. 11: Base of leaf x 1; fig. 12: Flower x 1/2; Fig. 13: Sepal x 1.

Type in the U. S. National Herbarium, No. 1,995,461, collected on páramo, Sierra de Perijá, 25 kilometers east of Codazzi, on the Venezuelan border, Department of Magdalena, Colombia, altitude 3000 meters, February 17, 1945, by Martin L. Grant (No. 10980).

ECUADOR

TILLANDSIA CYANEA Linden ex K. Koch var. ELATIOR L. B. Smith, var. nov.

A var. cyanea scapo valde altiore differt.

Scape to 29 cm. high.

Type in the Riksmuseet, Stockholm, collected about 27 km. from Chiriboga in the direction of Santo Domingo de los Colorados, Province of Pichincha, Ecuador, altitude ca. 2,000 meters, December 1952, by F. Fagerlind and G. Wibom (No. 1947).

In my revision covering Tillandsia cyanea (Contr. U. S. Nat. Herb. 29: 451. 1951), it is separated from T. lindenii by its even floral bracts. At first glance the present variety resembles T. lindenii because of its elongate scape, but shows its true affinity with T. cyanea not only by its floral bracts but also by its carinate sepals.

Plate I

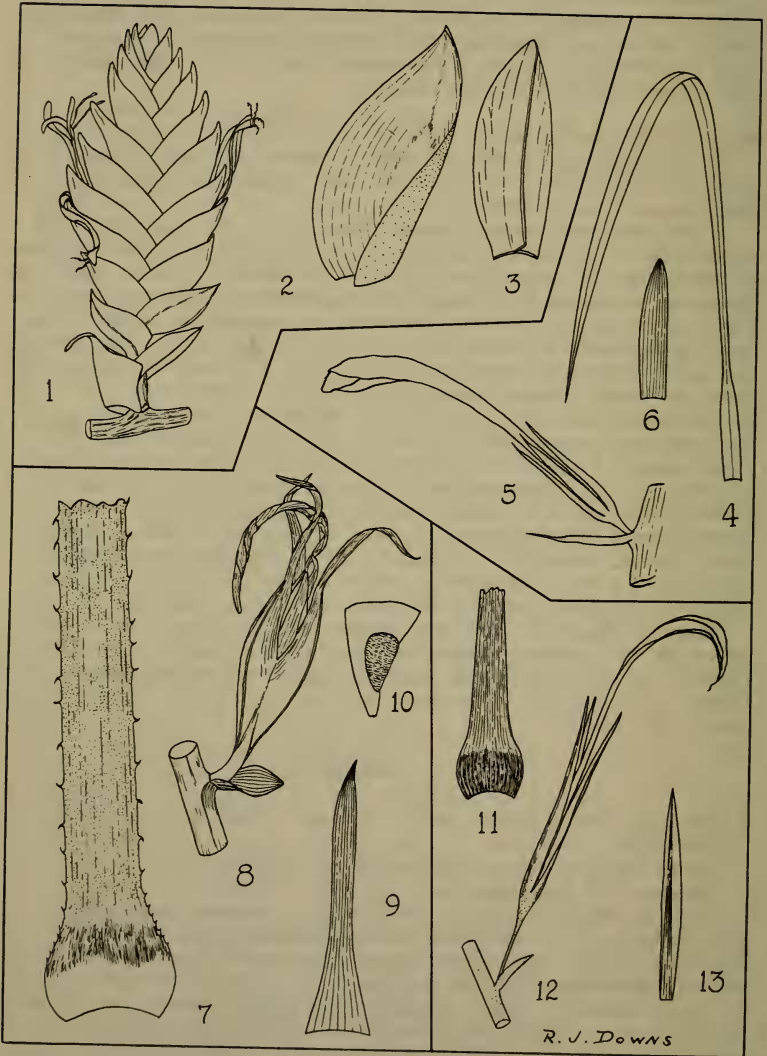
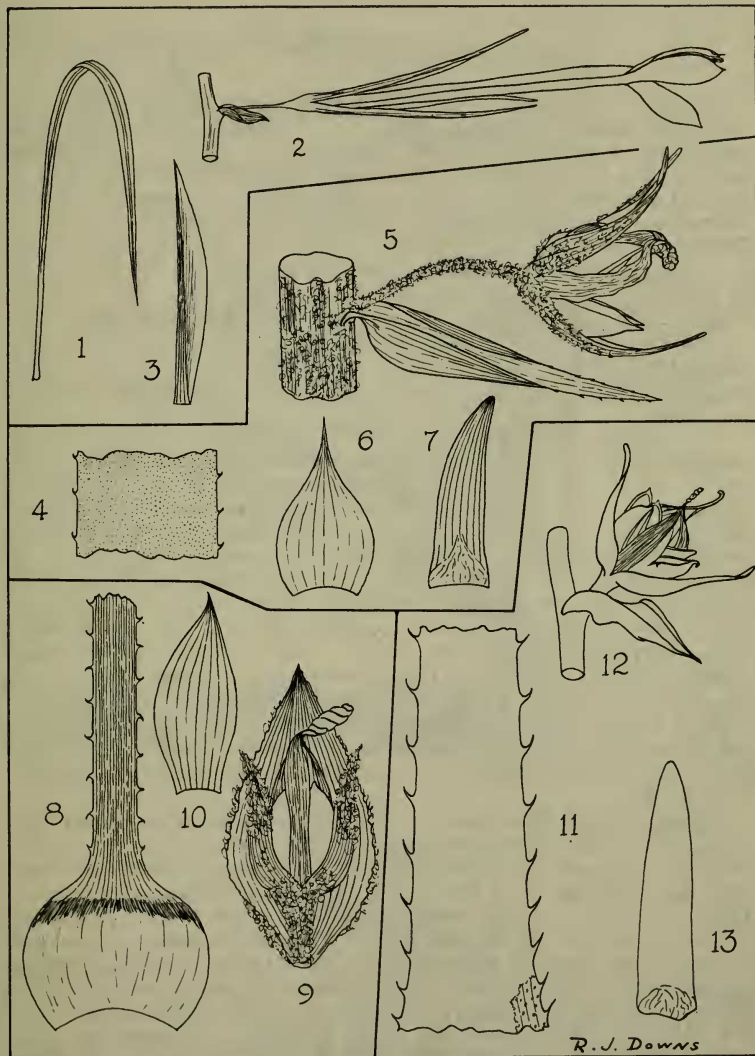


Fig. 1-3: *Tillandsia intumescens*; fig. 4-6: *Pitcairnia tympani*; fig. 7-10: *P. bulbosa*; fig. 11-13: *P. johannis*.

Plate II



R. J. Downs

Fig. 1-3: *Pitcairnia trimorpha*; fig. 4-7: *Puya barkleyana*;
fig. 8-10: *P. gargantae*; fig. 11-13: *P. grantii*.